Supreme Data Protection
- Enhanced S.M.A.R.T. and RAID 6 innovations

1. S.M.A.R.T. Optimization

AXUS S.M.A.R.T. utilization detects and reports status of hard drives and further corrects errors in advance, thus enriches the data availability. Major enhanced functions are Disk Self Testing, Disk Scrubbing and Disk Cloning.

Disk Self Testing

Enable the S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology) function to monitor the HDD installed in Yotta RAID series, and reports if any unhealthy status occurred.

The F/W will enable the RAID controller to collect the information on each HDD and reports any error.

- Prevent unrecoverable data loss
- Recover bad blocks
- Fix parity errors

Bad sectors
Remapped bad sectors

2. Disk Scrubbing

The firmware enables disk scrubbing to detect bad sectors and correct parity error to prevent unpredictable data loss.

1. Read all data and parity stripes row by row.
2. The parity will be updated if fails.
3. Data will be rebuilt to the remapped area if read error.
4. A warning message will be sent out if rebuild fails.

3. Disk Cloning

The firmware enables the controller to process disk cloning, either automatically or manually, on the spare HDD installed when the number of bad sectors remapped in the remap area is over the threshold specified by users.
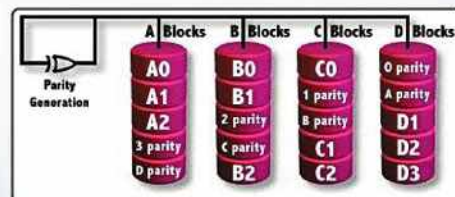
Reporting Over Threshold

Remapped bad sectors

Disk Cloning (Automatically or Manually)

Disk 1 Disk 2 Disk 3 Disk 4 Disk 5 Disk 6 Disk 7 Disk 8

Dick Cloning to the spare disk

- The copying operation starts from the first block of both disk and ends until it reaches the final block of source disk.
- There are three possible states a clone disk may stay in:
  - copying
  - copying pause
  - mirroring
- In any of these states, exception or users manual operation may abort clone disk

RAID 6

RAID 6 is essentially an extension of RAID 5 which implements a second independent distributed parity scheme. RAID 6 can handle the failure of any two drives in the array while other single RAID levels can handle at most one fault. It provides the highest level ever of data protection without sacrificing the performance.

Parity Generation

A Blocks	B Blocks	C Blocks	D Blocks
A0	B0	C0	D parity
A1	B1	1 parity	D0
A2	2 parity	A parity	D1
3 parity	C parity	C1	D2
B2	C2	D3	

Data and parity are striped on a block level across multiple array members, and a second set of parity is calculated and written across all the drives.

Need Something for Your Mission Critical Application?

Imagine an environment in which both of S.M.A.R.T. and RAID 6 enhancements existed.

RAID Subsystems

Specification

Model	YI-16SA2F2	YI-16SAEU4/YI-16SAEF2		YI-12SAEU4/YI-12SAEF2		YI-08SAEU4/YI-08SAEF2	
	2Gb Fibre	U4 SCSI	2Gb Fibre	U4 SCSI	2Gb Fibre	U4 SCSI	2Gb Fibre
Appearance							
RAID Engine	Intel Xscale i80331@667Mhz						
Controller#	1 or 2	1		1			
RAID Level	0,1,0+1,3,5,6,30,50,NRAID and JBOD						
Cache Support (Write Back)	Up to 2GB of 64-bit DDR 333 SDRAM						
System Type	Rack mountable 3U			Rack mountable 2U			
Host Interface	Dual FC 2Gb port per controller (cascade supported)	Dual Ultra 320 SCSI Channels	Dual 2 Gbit Fibre Channels	Dual Ultra 320 SCSI Channels	Dual 2 Gbit Fibre Channels	Dual Ultra 320 SCSI Channels	Dual 2 Gbit Fibre Channels
Disk Interface	SATA II						
Host Transfer Rate	200MB/sec per channel	320MB/sec per channel	2 Gbit/sec per channel	320MB/sec per channel	2 Gbit/sec per channel	320MB/sec per channel	2 Gbit/sec per channel
Disk Channels	16 of SATA II (3Gb)	16 of SATA II (3Gb)		12 of SATA II (3Gb)		8 of SATAII (3Gb)	
LCD Display	2 Lines by 16 characters						
Hot Swap and redundant	Yes (Power Supply , Hard Disk Drive & Fan)						
Hot Spare	Yes (Disk Down)						
Battery Back-up Module	Optional, Supporting up to 72 hours battery back-up time						
LAN	Web browser-based RAID manager via build in 10/100 Ethernet port						
Array Management Support	Yes						
Automatic Bad-Sector & Error Recovery	Yes						
Automatic Drive Rebuild	Yes. Automatic Data Rebuild						
Alarm buzzer and E-mail Notification	Yes						
Remote Terminal Configuration	Yes. Through RS-232 or 10/100 Ethernet port						
Operating System	OS independent and transparent						
Power Supply	Redundant by Dual 460W Power modules with PFC feature, Loading Sharing type and cable-less design.			Redundant by Dual 375W Power modules with PFC feature, Loading Sharing type and cable-less design.			
Electorical	AC Voltage 110-230 VAC / AC Frequency 50-60Hz						
Temperature	Operating Temperature : 10 to 35 degree C.						
Relative Humidity	20% to 80% non-condensing						
Dimension (mm)	446.4(W) x 132.4(H) x 557(D)	446.4(W)x 132.4(H) x 495(D)		482mm(W) x 482mm(D) x 2U			

*Specification subject to change without notice. All trademarks or registered trademarks are properties of their respective owners.

YOTTA
RAID Subsystems

SCSI U320 / FC to SATA Subsystems Powered with Enhanced RAID 6 and S.M.A.R.T Technology - Supreme Data Protection for Mission Critical Application

Features

- 3 Gbps SATA II disk Interface
- Supports SATA II Port Multiplier functions for more expansions
- Enhanced S.M.A.R.T. technology: Disk Self Testing, Disk Scrubbing, Disk Cloning
- Supports RAID 6 for more fault tolerance
- Dual Active-Active redundant controller to provide the best performance (FC to SATA II 16 Bays Model)
- Battery Backup Module to preserve cache contents from power failure
- Cableless architecture for better reliability
- Dual host channels support clustered environment.
- Array roaming allows a complete raid set moving to another system without losing RAID configuration and data.
- Built-in Ethernet port for remote event notification, Web GUI, configuration and management
- LCD control pad allows for complete unit configuration and instant visual system status

RAID Configuration

Supports up to 8 RAID sets, 16 volume sets, and 128 LUN.

RAID level 0, 1, 0 + 1 , 3, 5, 6, 30, 50, NRAID and JBOD.

Hot - Swappable drive operation.

Capacity

8 / 12 / 16 SATA - (300MB/sec) hard disk drives.

Up to 8 TB maximum capacity if using 16 X 500 GB hard drives.

Supports over 2TB in one single slice.

Online capacity expansion.

Cost-Effective SAN Environment: FC Cascade Function

With the AXUS integrated FC Cascade Function, SAN environment can be easily built to achieve more with less effort.

FC to SATA-II   FC to SATA-II   FC to SATA-II

- Arbitrated Loop through NL_port.
- Connected by optical Fibre Channel Cables
- Each port works as cascade function even the subsystem is failed or switched off.

Convenient Modularized Architecture

AXUS YOTTA RAID is a fully modularized design that replaces all the cables with connectors. RAID Controller, cooling fans, disk drives power supplies can be easily swapped to minimize the down time of the RAID service.

EZSecur Lock

The user-friendly lock is designed with keyless and secure 2 steps safety measurement to prevent accidental removal of the hard drive.

Smart and Fast cooling design: Ventilating more heat than others within the same time

Battery Backup Module

Optional Battery Back-up module prevents the data loss caused by sudden power off.

Advanced heat dissipation

AXUS' genuine advanced heat dissipation design keeps hard drive at a low operating temperature by redirecting drive's heat to the aluminium drive wall that ensures a longer life span of the hard drive.

Smart Redundant fan

Striking the balance between thermal and acoustics, AXUS' smart redundant fan operates at a highly efficient cooling mechanism. The design of the 2 linear redundant fans in a module works more efficient to ventilate the heat out from the rear.

Global RAID Management via Web Based GUI

The built-in management ethernet port provides easy access to the web-based GUI RAID Manager for configuration, management, and monitoring functions. It is OS-Independent and works cross-platform which allows configuration and status-monitoring remotely via standard web browsers from anywhere.
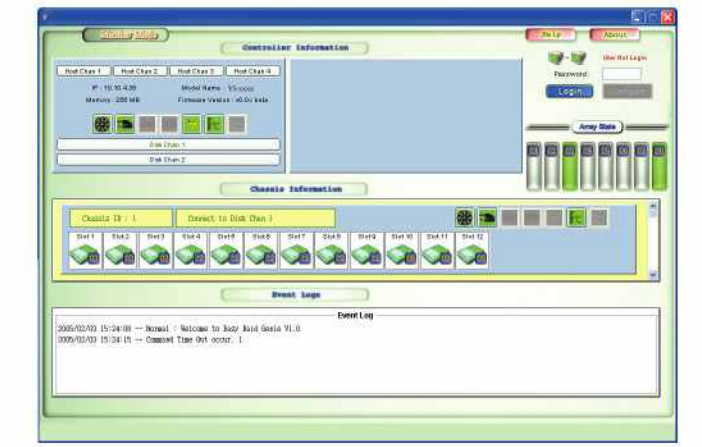
Features

RAID Status Monitoring

Displays array configuration, drive model and capacity

Monitors physical hard drives, temperature and fan

Displays drive status and indicates failed-drive location

RAID Configuration and Management

Re-configures RAID

Hosts ID-setting

Slices partition, Lun Mapping

Supports multiple RAID setups

Critical Event Notification

Automatically sends the event alert via emails

Events log recorded